

Atty. Docket No. 2001-0111-01
USSN 09/916,360

Amendments to the Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): A device for reducing vibration in a section of material, said vibration causing an acoustic disturbance in a range of frequencies detectable by a target, the device comprising:

an active damper comprising an electroactive element in electrical communication with an electrode, the active damper located a first distance from said section of material;

a passive damper comprising a sound reducing material, said passive damper located a second distance from said section of material,

wherein said second distance is greater than said first distance, and wherein at least one of the active damper and the passive damper reduces the magnitude of the acoustic disturbance reaching the target; and

a constraining layer disposed in contact with said passive damper

2. (canceled)

3. (currently amended): The device of claim 2-1 wherein the constraining layer is aluminum.

4.-5. (canceled)

6. (original): The device of claim 1, wherein said active damper damps low frequency acoustic disturbances and said passive damper damps high frequency acoustic disturbances.

Atty. Docket No. 2001-0111-01
USSN 09/916,360

7. (original): The device of claim 1, wherein the sound reducing material comprises a viscoelastic material.
8. (currently amended): The device of claim 1 wherein said viscoelastic material is selected from the group of viscoelastic materials consisting of: 3M Damping Foil, Soundcoat Soundfoil, EAR Tad Pad and Sorbothane.
9. (original): The device of claim 1, wherein said active damper is in mechanical contact with said section of material.
10. (canceled)
11. (original): The device of claim 1, wherein the active damper comprises a QuickPack® actuator.
12. (original): The device of claim 1, wherein the active damper further comprises a compensator including at least one positive position feedback (PPF) filter implemented on a digital signal processor (DSP).
- 13.-14. (canceled)
15. (original): A device for reducing audible noise in a vehicle by reducing vibration of a vehicle section, comprising:
an actuator attached to a surface of the vehicle section, the actuator comprising at least one piezoelectric element and at least one electrode;
a viscoelastic portion which is located outside the actuator with respect to the surface of vehicle section; and
a constraining layer having a higher stiffness than said viscoelastic portion;
wherein the at least one piezoelectric element and the at least one electrode are in electrical communication with each other; the constraining layer is in mechanical contact with the viscoelastic layer and wherein the device functions to reduce noise by the

Atty. Docket No. 2001-0111-01
USSN 09/916,360

actuator damping specific sound modes and by the viscoelastic portion damping all of the sound modes.

16.-17. (canceled)

18. (currently amended): A method of damping vibration in a section of material, said vibration causing noise audible to a human ear, comprising the steps of:

bonding an actuator having active damping means, ~~and~~ passive damping means and a constraining means in contact with the passive damping means to a desired portion of the section of material;

activating the active damping means to damp low frequency vibration in the section of material;

wherein the active damping means and the passive damping means together reduce noise to a greater extent than would be possible if the active damping means or the passive damping means act alone.